ORIGINAL

Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, D.C. 20554

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FILE

In the Matter of	)	
	)	
Redevelopment of Spectrum	)	
To Encourage Innovation	)	ET Docket No. 92-9
in the Use of New	)	
Telecommunications Technologies	)	

REPLY COMMENTS
MCCAW CELLULAR COMMUNICATIONS, INC.

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TO: The Commission

REPLY COMMENTS
OF MCCAW CELLULAR COMMUNICATIONS, INC.

McCaw Cellular Communications, Inc. ("McCaw"), by its attorneys, herewith submits its reply comments in the above-captioned rulemaking proceeding.[1] As demonstrated below, the record in this proceeding supports the following conclusions:

- First, because the Commission has not yet defined the emerging technologies that are to be allocated spectrum in the 2 GHz band, it is impossible to assess whether the public interest will be advanced by forcing current licensees to relocate in favor of the new services.

- Second, the Commission has not yet revised its technical rules concerning microwave use in those bands to which existing licensees are expected to migrate.

- Third, while it is clear that the Commission intends to designate a portion of the 2 GHz band for some form of PCS, it is also clear that many PCS proposals involve spectrum sharing, coexistence or only minimal dislocation of existing microwave

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[1] 7 FCC Rcd 1542 (1992) ("Notice"). Pursuant to an Order Denying Request To Defer Comment Dates in this docket and in RM-7981, the reply deadline was extended to July 8, 1992. DA 92-464 (June 4, 1992).

licensees; these proposals need to be evaluated and tested before a plan to evacuate the 2 GHz band is implemented.

- Fourth, the record shows that OET has significantly underestimated the costs and burdens of relocation.

- Accordingly, there is no sound basis to impose a mandatory relocation program on 2 GHz microwave users at this time; the Commission should first clarify what new services will be introduced into the 2 GHz band, and assess whether they can prosper through spectrum sharing and negotiated relocation -- and consider mandatory relocation only as a last resort.

I. SUMMARY

The Commission's challenge in this proceeding is to accommodate opportunities for new emerging technologies with the demonstrated spectrum needs of incumbent 2 GHz licensees. The comments repeatedly underscore that the Commission's actions will have profound effects for many categories of services -- private microwave networks supporting important public safety, government and industry requirements; common carrier networks underlying cellular and telephone services; and new emerging technologies such as personal communications services who seek spectrum homes. Obviously, these different interests give rise to inherent public policy tensions and conflicts that the Commission must ultimately harmonize.

Despite the far-reaching implications of this proceeding, the record reveals that interested and affected parties remain uncertain about the nature of likely future services to be placed in the 2 GHz band and how existing

services will continue their operations. The scope of "emerging technologies" has not yet been defined, making it difficult to assess their value or their need for exclusive access to 2 GHz spectrum. Conversely, the Commission has not taken the necessary steps to ensure that existing 2 GHz users can be accommodated in the frequency bands proposed for their relocation. As a result, many of the commenters join McCaw in the view that the Commission should not now order a massive relocation of 2 GHz licensees.

Instead, there is consensus across many industry segments that the Commission should consider the potential for new technologies to share spectrum or coexist with existing licensees before assuming that their displacement is essential. The record contains information on a number of proposed services that can share with existing operations or require only a minimal amount of dedicated spectrum. Obviously, shared use of the 2 GHz band would hold many benefits and would minimize dislocation problems.

A "look before you leap" approach is particularly warranted given the record before the Commission. Many of the existing users of 2 GHz spectrum have documented their anticipated costs and problems in attempting to replace existing facilities. Nearly all affected licensees point out that the report prepared by the Office of Engineering and

Technology ("OET")[2] has seriously underestimated the dollar amounts involved with the projected movement. Moreover, these parties also identify the many circumstances in which no alternatives to 2 GHz microwave frequencies are sufficient to meet operator needs.

Finally, existing licensees and new services proponents alike support the conclusion that it is premature for the Commission to consider a method of compelling current 2 GHz licensees to relocate (regardless of plans to compensate them for certain of the costs of doing so). Instead, these licensees should retain their primary status, and new technologies should be encouraged to share spectrum with existing users or, to the extent necessary, negotiate with them for voluntary relocation.

II. SUBSTANTIAL UNCERTAINTY EXISTS AMONG COMMENTING PARTIES CONCERNING THE VALUE OF NEW SERVICES AND THE MEANS TO ACCOMMODATE EXISTING SERVICES

As described below, a number of the comments in this proceeding reflect the fact that plans affecting the deployment of emerging technologies bands 1.85-1.99, 2.11-2.15, and 2.16-2.20 GHz are insufficiently concrete to permit a fair assessment of the action to be taken by the Commission. The nature and value of new technologies that

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[2] "Creating New Technology Bands for Emerging Telecommunications Technology," FCC/OET TS92-1 (Jan. 1992) ("OET Report").

may find a home in these bands are by no means certain at this time. Conversely, the steps necessary for accommodating the existing users of these frequencies -- who provide valuable services -- have not yet been taken. These circumstances lead many commenters to conclude that the Commission should not yet order a massive relocation.

A. "Emerging Technologies" Have Not Yet Been Defined

Substantial uncertainty remains about the nature of the new technologies to be deployed in the 2 GHz band. While possible future services raise very exciting prospects, little is known about their relative benefits, likely demand, or even whether 2 GHz is their appropriate home. The "technologies" remain to be defined with any sort of precision.

Many different types of claimants have emerged, in this proceeding and in GEN Docket 90-314, with different spectrum needs and different impacts upon existing users. At this time, personal communications services ("PCS") are only one set of many services that may fall in the "emerging technologies" category -- and it is no exaggeration to add that there is considerable confusion over the definition of PCS. No one currently knows what offerings outside the realm of PCS are also candidates for 2 GHz spectrum. Some of the categories of proposed services of which interested parties are aware at present include:

- Personal communications networks. There are various proponents of personal communications networks, based on a number of different technologies. These proposed services have varying levels of spectrum needs. American Personal Communications, for example, has asserted that its Fast Agile Sharing Technology will achieve efficient spectrum sharing with existing users. PCN America's wideband-CDMA system also is claimed to permit sharing with existing licensees. Other technologies may or may not require dedicated allocations of spectrum.

- Unlicensed wireless devices (Part 16). McCaw has previously discussed its Part 16 concept.[3] Comments from a number of equipment manufacturers and a variety of other entities enthusiastically support Commission recognition of unlicensed PCS services, which include enhanced residential cordless telephones and wireless PBXs. These services may need a small amount of spectrum allocated on an exclusive basis.

- Mobile satellite systems. Comsat and AMSC Subsidiary Corporation have focused on the need for spectrum allocations for mobile satellite services. These commenters have presented differing assessments as to the ability of mobile satellite services to co-exist with existing licensees in the 2 GHz band.

- Local loop replacements. Broadband Communications Corporation, for example, has proposed a radio-based broadband fixed link telecommunications service that would replace the local loop for residential and small business customers.

- Mobile data services. In conjunction with Omnipoint Corporation ("Omnipoint") and Oracle Data Publishing, Inc. ("Oracle"), McCaw has proposed Data BroadCast Service ("DBCS"). This service involves high speed, wireless point-to-multipoint data transmission. Other entities have proposed wireless local area networks, also referred to as Data-PCS.

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[3] McCaw Comments at 22-23.

- Wireless payphone services. Proposed services are referred to as telepoint (CT-2) and enhanced telepoint (CT-2+ and CT-3).

The nature of the new services ultimately selected by the FCC for the 2 GHz band will have a critical impact on the extent to which relocation efforts are required or appropriate. Since little is known about many of the new services to be promoted, it is inefficient for the Commission to order relocation of the entire 2 GHz band at this time. Furthermore, while the clearing of a small amount of spectrum may be necessary for some services, others have demonstrated their ability to share spectrum with existing users, making them preferred candidates for the 2 GHz band.

B. The Commission Has Not Yet Resolved Where and How Needs of Existing and Future Microwave Licensees Can Be Accommodated

Many of the existing users of 2 GHz spectrum have concluded that the Notice's scheme for implementing relocation simply does not go far enough in identifying meaningful replacement alternatives.[4] Specifically, the Notice proposes that existing fixed microwave users be granted access to bands above 3 GHz, with the provision that eligibility requirements for those bands would be waived.[5] Consistent with McCaw's observations in its opening comments,

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[4] E.g., Utilities Telecommunications Council at 44-48; Alcatel Network Systems, Inc. at 13-14.

[5] Notice, 7 FCC Rcd at 1544-1545.

a number of parties have indicated that the Commission must promptly explore necessary changes to its rules to address the technical requirements of displaced 2 GHz users.[6]

The Commission has before it the petitions for rulemaking filed by the Utilities Telecommunications Council ("UTC")[7] and Alcatel Network Systems, Inc. ("Alcatel).[8] These petitions propose rule changes in various frequency bands that might serve as alternative spectrum homes for existing 2 GHz microwave operations. Many of the commenting parties have observed that the current technical and eligibility provisions for frequencies above 3 GHz could preclude common carriers and private licensees from successfully transferring to higher bands.[9]

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[6] E.g., Pacific Telesis Group at 20-21; U S West, Inc. at 16-17; Basin Electric Power Cooperative at 4; Central Power and Light Company at 3; Corn Belt Power Cooperative at 2; Pacificorp at 3; Large Public Power Council at 35-38.

[7] Utilities Telecommunications Council Petition for Rulemaking in the Matter of Amendment of Parts 2, 21, and 94 of the Commission's Rules To Accommodate Private Microwave Systems in the 1.71-1.95 Band and in Bands Above 3 GHz, RM-7981 (filed Mar. 31, 1992) ("UTC Microwave Accommodation Petition").

[8] Alcatel Network Systems, Inc. Petition for Rulemaking in the Matter of Amendment of Parts 2, 21, 25 and 94 of the Commission's Rules To Accommodate Common Carrier and Private Op-Fixed Microwave Systems in Bands Above 3 GHz, RM-8004 (filed May 22, 1992) ("Alcatel Microwave Accommodation Petition").

[9] E.g., Alcatel Network Systems at 30-34; The Coastal Corporation at 15; Large Public Power Council at 35-38; Public Safety Microwave Committee at 16-19; Utilities Telecommunications Council at 49-53.

(continued...)

For example, rechannelization of the 4, 6, and 11 GHz bands is necessary to incorporate the narrower bandwidths now found at 2 GHz.[10] Similarly, the present loading requirements of these bands must be examined, modified, or eliminated, and minimum path length requirements, antenna standards, and modulation efficiency standards all must be adapted for 2 GHz common carrier and private microwave licensees.[11]

There was strong support for Commission initiation of further proceedings designed to adopt the necessary rules.[12] It was agreed that such rules are a necessary prerequisite to

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[9](...continued)

While the Commission has proposed to waive the eligibility requirements to accommodate existing 2 GHz licensees, it is also important for the Commission to address eligibility prerequisites in the various fixed microwave bands in order to provide a spectrum home for new paths that otherwise would be constructed using 2 GHz frequencies that are now not available.

[10] E.g., United Telephone Companies at 9-10; Basin Electric Power Cooperative at 4; Idaho Power Company at 1; Telesciences, Inc. at 19-20, 22.

[11] E.g., Basin Electric Power Cooperative at 4; Large Public Power Council at 36; Alcatel Network Systems, Inc. at 14-15.

[12] E.g., American Gas Association at 5; Telecommunications Industry Association Point-to-Point Communications Section at 1-2. MCI Telecommunications Corporation cautions that necessary arrangements must be carefully planned and implemented to ensure that adequate frequencies are available to meet increasing demand for fixed microwave links. MCI Telecommunications Corporation at 4.

any forced relocation of existing 2 GHz users.[13] Moreover, such rule changes would facilitate efforts to achieve agreement on voluntary migration plans. The absence of such efforts to date, however, leaves commenting parties unsure as to what alternatives in fact would be available to them in the event they are required to find new transmission media.

C. A Number of Parties Agree With McCaw's Assessment That Displacement of Existing Users Should Not Occur in This Policy Vacuum

Many commenting parties have pointed out the extreme difficulty of attempting to assess the value of competing uses and determine whether spectrum should be reallocated given the lack of certainty about what new services would be created and how existing services would be relocated.[14] Existing services employing 2 GHz frequencies clearly provide numerous public benefits.[15] In the absence of concrete plans

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[13] E.g., Alcatel Network Systems, Inc. at 30-34; United States Department of Energy at 5; National Spectrum Managers Association at 1.

[14] E.g., Association of American Railroads at i, 6, 15, 47.

[15] For example, cellular services today offer unprecedented mobility and reliability of service, thus promoting business productivity and providing expanded access to emergency services. Southwestern Bell Corporation at 11. Other common carriers also find that 2 GHz frequencies play a critical role in their ability to provide service to the public, particularly in remote or sparsely populated areas. Bluegrass Cellular, Inc. at 1-3; Centel Corporation at 3-6; Organization for the Protection and Advancement of Small Telephone Companies at 4-7; Southwestern Bell Corporation at

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for relocating these users to other microwave frequencies or other transmission media -- and for payment of the costs of such moves -- the impact of the Notice's proposals cannot be realistically assessed.

Similarly, numerous parties concur that a better understanding of the specific new technologies being considered for deployment in the 2 GHz band is essential for considering the demand and benefits associated with new services as well as the extent to which relocation of existing 2 GHz microwave licensees is actually necessary.[16] At present, however, the absence of firmer Commission plans requires the conclusion that any action to order broad

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[15](...continued)
10-13.

Private microwave licenses similarly are used for a host of highly beneficial services. For example, facilities are used to help monitor for breaks in gas pipelines, and to speed the de-energizing of high voltage power lines in emergencies. American Gas Association at 6-7; Questar Corporation at 2-3, 7-8; Nevada Public Service Commission at 1-2; Sho-Me Power Electric Cooperative at 3; Texas Gas Transmission Corporation at 2-3; El Paso Natural Gas Company at 2-3; Interstate Natural Gas Association of America at 2. The 2 GHz frequencies help to form the backbone of public safety radio communications systems. Arizona Department of Public Safety at 1-2; Public Safety Microwave Committee at 5-9.

[16] E.g., ALLTEL Companies at 5; Cellular Telecommunications Industry Association at 3; GTE Service Corporation at 6-8; OCOM Corporation at 16-17; Telesciences, Inc. at 11-14.

disruptions of existing 2 GHz operations would be premature.[17]

III. NUMEROUS PROPOSALS ARE PENDING BEFORE THE COMMISSION FOR NEW SERVICES THAT INVOLVE SPECTRUM SHARING, COEXISTENCE, OR MODEST DISLOCATIONS TO EXISTING MICROWAVE LICENSEES

As pointed out by a number of parties, the Notice in this proceeding completely overlooks the possibility of launching new technologies through the shared use of spectrum with existing 2 GHz operators.[18] Many parties commented on this omission, and urged the Commission to alter its course and to focus substantial effort on exploring and encouraging means for promoting the sharing of spectrum. Other parties, however, doubt the efficacy of sharing. This difference of opinion highlights an important point -- until the feasibility of spectrum sharing among new and existing 2 GHz licensees is addressed by the Commission, the public will be deprived of an accurate cost-benefit analysis. To a large extent, the viability of spectrum sharing will depend on the types of new services to be deployed and the amount of bandwidth each will be allowed to utilize. These questions are properly considered in a Notice of Proposed Rulemaking

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[17] E.g., Edison Electric Institute at 3-4; The Large Public Power Council at 3-8.

[18] E.g., Centel Corporation at 7; Edison Electric Institute at 19-20.

focused on the emerging technologies that will be designated for 2 GHz assignments.

A. Numerous Commenters Agree That Spectrum Sharing Opportunities Should Be Considered Before Any Relocations Are Ordered

There is broad-based support for Commission consideration of potential spectrum sharing technologies. The opening comments emphasize that sharing could be a technically[19] and economically feasible alternative to the wholesale reallocation of the 2 GHz band.[20] Existing licensees and PCS proponents alike agree that spectrum sharing ought to be addressed as a preferred solution to the competing demands for scarce radio spectrum.[21] Current 2 GHz users as well as those in favor of prompt initiation of new technologies offerings (including PCS) have argued emphatically that such sharing will best promote achievement

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[19] While various experiments have not yet provided conclusive evidence that sharing is feasible, that is no reason to rule out the possibility at this early stage in the technical development of services such as PCS. Rather, the fervent support of many of these new technology entrepreneurs for sharing techniques suggests that the Commission should actively explore methods for achieving successful cooperative spectrum use.

[20] E.g., Centel Corporation at 6-7; Associated PCN Company at 3-7; Impulse Telecommunications Corporation at 2-3; Rose Communications, Inc. at 12-13; Spatial Communicationa, Inc. at 2-5; Telocator at 11-12.

[21] E.g., American Personal Communications at i, 4-5; National Rural Electric Cooperative Association at 5, 10; Southwestern Bell Corporation at 3-4.

of the goals set forth in the Notice -- introduction of new services with a minimum of disruption to current uses.[22]

As recognized in many of the comments, spectrum sharing offers a range of benefits. First, the Commission can address the scarcity of frequencies by introducing new services on a spectrum-efficient basis. By rewarding innovators who have designed systems to operate on a shared basis with other services, the Commission will encourage other potential new service providers to test technologies that make the most efficient use of frequencies.

Second, if these proposed services can successfully share or co-exist with 2 GHz licensees, existing services need not face the devastating consequences of relocation. By promoting sharing, the Commission could initiate new technologies without removing existing operations from their assigned frequencies. Such action could easily save members of the public from incurring significant cost and inconvenience associated with relocation for existing 2 GHz fixed microwave users.

While for the most part the commenters agree that spectrum sharing should be granted greater consideration by the Commission, a minority belittle the benefits of sharing

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[22] E.g., Advanced Mobilecomm, Inc. at 7; Associated PCN Company at 3-7; COMSEARCH at 1, 11-13, 15; Millicom, Inc. at 3-5; Omnipoint Corporation, Oracle Data Publishing, Inc., and McCaw Cellular Communications, Inc. at 1; Telocator at 11-12.

and some even go so far as to dismiss its feasibility entirely.[23] This discrepancy is natural given the Commission's silence in this area.

As detailed in the preceding Section II, the Commission cannot affirmatively address the viability of sharing, without first addressing the even more fundamental issues of what services would serve the public interest. For example, the ability of a service to share spectrum in any given portion of the 2 GHz band depends in large measure on the type of service located there. Obviously, some services may be better suited to spectrum sharing than others. Similarly, some frequencies in the 2 GHz band may accommodate sharing more readily than others. The success of sharing may also depend on the amount of spectrum these new technologies require. As the comments indicate, there is general disagreement among service providers of the same type regarding this amount. Until the Commission has answered these and other preliminary questions, sharing will remain an attractive but unproven option.

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[23] E.g., AMSC Subsidiary Corporation at 9; Apple Computer at 3-4; Central Power and Light Company at 3; Hewlett-Packard Company at 4; Institute of Electrical and Electronic Engineers/802 Local Area Network Standards Committee at 8; Time Warner Telecommunications, Inc. at 11-12.

B. The Record Catalogs a Host of New Services That Might Be Able To Share, Coexist With, or Only Modestly Dislocate Existing Services

Notwithstanding these uncertainties, there are numerous pending proposals for new services that purportedly can coexist with incumbent 2 GHz operations. In particular, many of the likely applicants for PCS licenses and other participants in the industry indicate that they have developed or have access to technologies that will permit successful sharing of 2 GHz spectrum. Given the current need for information, the Commission would be remiss in not exploring these sharing opportunities before -- rather than after -- ordering 2 GHz licensees out of their band. Set forth are examples of potential future services and their spectrum sharing potential that ought to be addressed in further rulemaking proceedings.

1. Personal Communications Networks ("PCNs"). A number of new services proponents, including American Personal Communications ("APC") and PCN America, have suggested possible deployment schemes and technologies that would permit PCNs to be deployed with minimal impact on existing spectrum users. APC, for example, has conducted a study of microwave usage in the top 11 markets in the United States and evaluated a "Frequency Agile Sharing Technique" ("FAST") for co-existing with private microwave operations. APC has purportedly developed base station technology that

creates a list of usable channels in a given area relying on database information and propagation modeling. This data is used to select the appropriate channel for a particular PCN call in order to minimize interference to the PCN user and any microwave systems in the region. Utilizing this FAST system, APC states that "beginning today, [APC could] build and operate an effective PCS system in any of the top 11 urban markets . . ."[24] and that "[t]he FAST System will permit PCS to share the 1.85-1.99 GHz band with incumbent users without causing interference to those users."[25]

PCN America, for its part, also proposes technology that purportedly will allow PCNs to be deployed without significantly affecting existing users. PCN America's system relies on a time division duplex wideband spread spectrum scheme developed in conjunction with Rockwell. Utilizing this wideband CDMA technique, "small-size cells with multiple antennas necessitating only very low-power mobile equipment . . ., and tunable notched filters," PCN America's system "will allow the majority of point-to-point microwave operations to coexist with PCS . . . [without exceeding] the

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[24] APC Supplement to Petition for Rulemaking at 6, GEN Docket 90-314 (filed June 25, 1992).

[25] Id. at 8.

10E interference parameters . . . under normal operation of both the microwave system and the PCS system."[26]

2. Unlicensed or Part 16 services. A number of commenting parties voiced substantial support for unlicensed PCS operations, which may include wireless PBX systems, enhanced residential cordless telephone services, wireless local area networks, and user-PCS.[27] In its opening comments, McCaw briefly described its proposed Part 16 plan as an example of a service designed to create an environment for in-building and on-premises systems that allows unlicensed access to spectrum by multiple service providers while still offering interference protection rights.[28]

The Wireless Information Network Forum ("WINForum") believes that non-licensed, portable User-PCS computing and communications devices will ultimately require dedicated frequency allocations.[29] Other parties are more optimistic

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[26] PCN America Amendment, GEN Docket 90-314, PP-5, Appendix A at 2 (filed June 25, 1992). Ameritech claims to have developed a frequency agile approach in a trial that would permit interference free sharing. Ameritech at 10-11. See also Associated PCN Company at 6-7; Southwestern Bell Corporation at 3-4; SCS Mobilecom, Inc. at 6, 18; Spatial Communications, Inc. at 2-5.

[27] E.g., APC at 6; Apple Computer, Inc. at 2-4; Hewlett-Packard Company at 2; Motorola, Inc. at 10-13, 20-28; North American Telecommunications Association at 6; Personal Communications Network Services of New York, Inc. at 9; SpectraLink Corporation at 3-4; ROLM Systems at 8-10; WINForum at 3; Rose Communications, Inc. at 2-9.

[28] McCaw Comments at 22-23.

[29] WINForum at 3.

about the long-term as well as immediate feasibility of allocating spectrum to non-licensed devices on a shared basis with existing microwave facilities. Obviously, the issue of sharing must be explored in greater depth with regard to Part 16 services. However, it appears that the initial needs of Part 16 (unlicensed) use could be accommodated with no more than a modest amount of "clear" spectrum nationwide, accompanied by adjoining spectrum available on a shared basis with microwave licensees.[30]

3. Data BroadCast Service. In their Pioneer's Preference Reply Comments,[31] Omnipoint, Oracle, and McCaw demonstrated that DBCS can co-exist with fixed microwave users in the 2 GHz band without creating huge exclusion zones. Because DBCS mobiles are receive-only, the only potential sources of interference are the fixed DBCS transmitters. In actual field tests in a real world environment using a functioning microwave tower, an omnidirectional DBCS transmitter at every range 2.0 miles or more from the microwave facility -- with line-of-sight to the microwave tower -- could be operated at up to 478 mW without exceeding the 1 dB noise floor of the microwave link. Under the DBCS deployment scheme, of course, these transmitters can

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[30] See Attachment A.

[31] See Reply Comments of Omnipoint Corporation, Oracle Data Publishing, Inc. and McCaw Cellular Communications, Inc. at 1-3, GEN Docket 90-314, PP-41 et al. (filed June 26, 1992).

be located much closer by utilizing lower power transmitters and antenna sectorization. Under these circumstances, it is eminently clear that DBCS can be deployed without the massive relocation of existing 2 GHz microwave users proposed by the Commission.

IV. THE RECORD SHOWS THAT OET HAS SIGNIFICANTLY UNDERESTIMATED THE COSTS AND BURDENS OF RELOCATION

The record is replete with evidence that both the OET Report and the Notice seriously underestimate and in some instances omit the actual costs and burdens associated with displacing existing users.[32] One commenter estimated the costs of relocation to be nearly ten times the OET projections.[33] In addition, the Notice too readily accepts the notion that alternative means (radio-based or otherwise) can be easily deployed,[34] and fails to consider that some

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[32] E.g., ALLTEL Companies at 2-5; Centel Corporation at 16-20; GTE Service Corporation at 18; Huffman Communications, Cal Autofone, and Radio Electronics Products Corp. at 2; OCOM Corporation at 5-12; Pacific Telesis Group at 6-7; American Public Power Association at 9-11; Association of American Railroads at 40-42; The Large Public Power Council at 40-41; Utilities Telecommunications Council at 46-48; Associated PCN Company at 1-2.

[33] Southwestern Bell at 8.

[34] E.g., ALLTEL Companies at 4; Alcatel Network Systems at 23-25; The Coastal Corporation at 13-14; NYNEX Mobile Communications Company at 3; Public Safety Microwave Committee at 19-20; MCI Telecommunications Corporation at 3; United States Telephone Association at 7-8; Vanguard Cellular Systems, Inc. at 13.

licensees may be unable to move their 2 GHz links to some alternate frequency or service.

In its opening comments, McCaw enunciated a list of deficiencies contained in the calculation of costs and identification of problems set forth in the OET Report and the Notice. Other flaws identified by the commenting parties include:

- There probably is not enough technological or construction talent available to replace all 2 GHz systems in 3 to 10 years.[35]
- OET did not review frequency coordination along essentially parallel paths.[36]
- The OET Report did not consider a wide enough range of frequencies.[37]

The Commission has proposed encouraging new technologies service providers to negotiate with current licensees to achieve mutually acceptable relocation plans.[38] At the same time, if no agreement were reached, existing licensees still would be forced out of the 2 GHz frequencies at some fixed date.[39] Several parties point out, in that event, that the

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[35] Arizona Public Service Company at 2.

[36] Central and South West Corporation at 3.

[37] E.g., American Petroleum Institute at 5-14; GTE Service Corporation at 9-11; Harris Corporation, Farinon Division at i; Interstate Natural Gas Association of America at 2-3; Telesciences, Inc. at 6, 18-19, 22; Metropolitan Water District of Southern California at 11-13.

[38] Notice, 7 FCC Rcd at 1545.

[39] Id.

direct and indirect costs necessary for finding a new transmission home will be passed on to consumers of telecommunications and other services.[40] Bluegrass Cellular, Inc., for example, states that relocation would roughly triple the cost of cellular operations.[41] In the case of government licenses or services relied upon by governments, this could mean higher taxes.[42] At least one party has suggested that it could be forced into bankruptcy if required to bear the financial burden of moving from its existing 2 GHz facilities.[43]

The comments stress that there are many situations where alternative frequencies or alternative transmission means simply are not available as a real life matter.[44] A number

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[40] E.g., Union Telephone Company at 2; Atlantic City Electric Company at 5; Arizona Public Service Company at 2; Central Maine Power Company at 2; Interstate Natural Gas Association of America at 8.

[41] Bluegrass Cellular, Inc. at 1-2.

[42] E.g., Public Safety Microwave Committee at 10-13; Tarrant County Water Control and Improvement District Number One at 2-3.

[43] Sunflower Electric Power Corporation at 2-3.

[44] E.g., Cellwave, Inc. at 4 n.6; JSM Tele-Page, Inc. at 4 n.5; Mega-Tel Limited Partnership at 4 n.6; Miscellco Communications, Inc. at 4 n.6; R & D Cellular, Inc. at 4 n.6; Rocky Mountain Telecommunications Association at 5-8, 10; Sooner Cellular, Inc. at 4 n.6; Sterling Cellular Limited Partnership at 4 n.6; Sunshine Cellular at 4 n.6; American Gas Association at 5-7; American Public Power Association at 2-7; Association of American Railroads at 38-40; Central and South West Corporation at 2-3; Central Power and Light Company at 2; East River Electric Power Cooperative at 1; El

(continued...)

of commenters have found that higher band frequencies cannot meet their performance standards as a result of the technical characteristics of those frequencies.[45] Similarly, frequency coordination in acceptable bands may not be possible to achieve.[46] Zoning, terrain, and environmental matters may also render alternative frequencies unusable as a practical matter.[47]

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[44](...continued)
Paso Natural Gas Company at 13-16; Metropolitan Water District of Southern California at 6-9.

[45] E.g., OCOM Corporation at 3-9; Southwestern Bell Corporation at 7-8; American Gas Association at 4-5; American Public Power Association at 11-13; Centerior Energy Corporation at 3; Interstate Natural Gas Association of America at 7-8; Public Safety Microwave Committee at 16-19; Harris Corporation, Farinon Division at 3.

[46] E.g., OCOM Corporation at 5-7; Southwestern Bell Corporation at 7-8; American Gas Association at 4-5; Edison Electric Institute at 12-13; Public Safety Microwave Committee at 16-19.

[47] E.g., Montana Power Company at 2-4; Rocky Mountain Telecommunications Association at 2-3, 5; Seattle City Light at 2; Western Resources at 2.